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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/570,138	03/01/2006	Takashi Tani	Q81296	5057
23373 7590 06/03/2008 SUGHRUE MION, PLLC 2100 PENNSYLVANIA AVENUE, N.W. SUITE 800 WASHINGTON, DC 20037				
EXAMINER KOSLOW, CAROL M				
ART UNIT		PAPER NUMBER		
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/570,138

Applicant(s)

TANI ET AL

Examiner

C. Melissa Koslow

Art Unit

1793

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 March 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) 2-4, 7, 13 and 22-27 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 5, 6, 8-12 and 14-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 March 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 3/1/06, 5/12/06
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

GB 1,358,224 cited in the information disclosure statement filed 12 May 2006 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each cited foreign patent document; each non-patent literature publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. It has been placed in the application file, but the information referred to therein has not been considered.

While applicants have provided the abstract for GB 1,358,224, this is not the actual document. The listing on the PTO-1449 indicates that actual document was filed.

The Japanese language references cited in information disclosure statement filed 12 May 2006 have been considered with respect to the provided English abstracts.

Applicant's election without traverse of Group I and Species I in the reply filed on 25 March 2008 is acknowledged.

Applicants are correct that claimed 25 should have been part of Group I. It was inadvertently left out of Group I.

The species on page 3 of the restriction requirement of 25 February 2008 were not numbered. The first species listed is "phosphorescent metal oxides" and the Examiner is interpreting "Species I" as being that species. Thus the claims that read upon the claimed species are 1, 5, 6, 8-12 and 14-21; not 1, 5, 6, 8-12 and 14-16, as indicated by applicants. Claims 17-21 are directed to phosphorescent metal oxides

Claims 2-4, 7 13 and 22-27 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention and species, there being no allowable generic or linking claim. Election was made **without** traverse.

The disclosure of the prior-filed application, Application No. 60/567,011, provides adequate support or enablement in the manner provided by the first paragraph of 35 U.S.C. 112 for one or more claims of this application.

Accordingly, the claimed subject matter has the effective filing date of 3 May 2004.

The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609.04(a) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered.

JP-B-1033945 discussed in the specification has not been cited in an information disclosure statement.

The drawings are objected to because figure 3 is so faint, what is being shown cannot be seen. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an

application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

The disclosure is objected to because of the following informalities:

It is unclear for the formulas "(Y,Gd)₂O₃", "(Y,Gd)BO₃" and "(Mg,Sr,Ba)Al₁₂O₁₉" if both of the elements in the parenthesis must be present or if only one need be present. The art interprets these formulas both ways and thus applicants need to make clear which interpretation they are using. The formula (Ba,Mg)Al₁₀O₁₇ is incorrect, as written. In the phosphor art, the use of parenthesis is interpreted to mean Ba_{1-x}Mg_x, where x is 0-1 or 0<x<1. The correct way this formula is written is BaMgAl₁₀O₁₇. Appropriate correction is required.

Claim 21 is objected to because of the following informalities: The formula (Ba,Mg)Al₁₀O₁₇ is incorrect, as written. In the phosphor art, the use of parenthesis is interpreted to mean Ba_{1-x}Mg_x, where x is 0-1 or 0<x<1. The correct way this formula is written is BaMgAl₁₀O₁₇. Appropriate correction is required.

Claims 18-20 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

It is unclear for the formulas "(Y,Gd)₂O₃", "(Y,Gd)BO₃" and "(Mg,Sr,Ba)Al₁₂O₁₉" if both of the elements in the parenthesis must be present or if only one need be present. The art interprets these formulas both ways and thus applicants need to make clear which interpretation they are using.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 5, 8, 9, 12, 14, 16-18 and 21 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. patent 6,391,273.

This reference teaches producing oxide phosphors by forming gaseous organometallic complex precursor compounds for the phosphor and heating at 600-1600°C to combust or pyrolyze the mixed gas in the presence of a reaction gas, such as oxygen or an oxygen containing gas. The resulting oxide particles have a mean particle size of 100 nm or less, which falls within the claimed range, since the mean size and the number average appear to be the same. The phosphors produced by this method can be BAM, which has the formula $\text{BaMgAl}_{10}\text{O}_{17}:\text{Eu}$, or $\text{Y}_2\text{O}_3:\text{Eu}$. The example teaches using β -diketone metal complexes, such as tetramethylheptanedionate or 2,2,6,6-tetramethyl-3,5-heptanedionate as the organometallic complex precursor compounds for the phosphor. The reference teaches the claimed method.

Claims 1, 5, 8-11, 14, 16-18, 20 and 21 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. patent application publication 2002/0179886.

This reference teaches producing oxide phosphors by forming gaseous organometallic complex precursor compounds for the phosphor and heating at 400-1400°C to combust or pyrolyze the mixed gas in the presence of a reaction gas, such as oxygen or an oxygen containing gas. The reference teaches that the process produces $\text{YBO}_2:\text{Eu}$, $\text{GdBO}_3:\text{Eu}$, $\text{Y}_2\text{O}_3:\text{Eu}$, $\text{Zn}_2\text{SiO}_4:\text{Mn}$ and $\text{BaMgAl}_{10}\text{O}_{17}:\text{Eu}$ and that the organometallic precursors can be alkyl metals,

such as diethyl zinc or dimethylzinc and metal alkoxides, such as silicon tetraethoxide, aluminum ethoxide, aluminum i-propoxide and aluminum sec-butoxide. Column 15 teaches the number average particle diameter of the produced oxides is about 5 to about 50 nm, which falls within the claimed range. The reference teaches the claimed process.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. patent 6,391,273 or U.S. patent application publication 2002/0179886.

As discussed above, both of these reference teach the claimed process. They do not teach the amount of reaction gas, but they both implicitly teach that it is present in a sufficient amount so as to produce oxide powders for organometallic vapors. This amount appears to at least overlap the claimed amount since the claimed amount is that sufficient to produce oxide powders for organometallic vapors, absent any showing to the contrary. Product claims with numerical ranges which overlap prior art ranges were held to have been obvious under 35 USC 103. *In re Wertheim* 191 USPQ 90 (CCPA 1976); *In re Malagari* 182 USPQ 549 (CCPA 1974); *In re Fields* 134 USPQ 242 (CCPA 1962); *In re Nehrenberg* 126 USPQ 383 (CCPA 1960). The references suggest the claimed process.

Claims 6 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. patent application publication 2002/0179886.

As discussed above, this reference teaches the claimed method. Column 15 teaches the number average particle diameter of the produced oxides is less than about 500nm, which overlaps the claimed range. Product claims with numerical ranges which overlap prior art ranges were held to have been obvious under 35 USC 103. *In re Wertheim* 191 USPQ 90 (CCPA 1976); *In re Malagari* 182 USPQ 549 (CCPA 1974); *In re Fields* 134 USPQ 242 (CCPA 1962); *In re Nehrenberg* 126 USPQ 383 (CCPA 1960). The reference suggests the process of claim 16. Column 6, lines 55-66 teaches that if a solid organometallic precursor is used it can be dispersed in a solvent, such as an alcohol, and that this dispersion is gasified. The taught solvent reads upon the claimed combustion improver, thus the reference suggests the process of claim 6.

Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. patent application publication 2002/0179886 in view of U.S. patent application publication 2003/0118841.

As discussed above, U.S. patent application publication 2002/0179886 teaches the claimed method. This reference teaches boron sources, such as diborane, boron hydride and boron trichloride, but it does not teach using organometallic boron sources, such as organic borate. It does imply that any known boron source that can be vaporized can be utilized. U.S. patent application publication 2003/0118841 teaches forming oxides, such as boron containing oxides, by a process similar to that taught in U.S. patent application publication 2002/0179886. Column 28, lines 39-42 teaches vaporizable sources of boron can be ammonium borate, ethyl borate or ethyl boride. Thus it indicates that these boron sources are functionally equivalent to those in U.S. patent application publication 2002/0179886. One of ordinary skill in the art would have found it obvious to use the functionally equivalent ammonium borate or ethyl borate as the

boron source in the process of U.S. patent application publication 2002/0179886. the references suggest the claimed process.

Claims 20 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. patent 6,391,273 in view of U.S. patents 3,574,131 and 3,684,730.

As discussed above, U.S. patent 6,391,273 teaches the claimed method. Column 5, lines 47-51 teaches that other known rare earth activated yttrium oxide phosphor can be produced by the taught method. U.S. patents 3,574,131 and 3,684,730 teaches examples of rare earth activated yttrium oxide phosphor that were well known at the time of invention. One of ordinary skill in the art would have found it obvious to produce the rare earth activated yttrium oxide phosphors of U.S. patents 3,574,131 and 3,684,730, such as terbium or thulium activated yttrium oxide, by the process of U.S. patent 6,391,273. The references suggest the claimed process.

U.S. patents 5,471,113 and 6,809,781 are cited as of interest since they teach BAM is the abbreviation for the phosphor having the formula $\text{BaMgAl}_{10}\text{O}_{17}:\text{Eu}$. U.S. patent 3,894,164 is cited as of interest since it shows tetramethylheptanedionate and 2,2,6,6,-tetramethyl-3,5-heptanedionate are the same. U.S. patent 3,984,587 is cited as of interest since it teaches forming divalent cation silicate, divalent cation borate and divalent cation aluminate phosphor films from vapors of alkyl metal precursors and β -diketone metal complexes precursors.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Melissa Koslow whose telephone number is (571) 272-1371. The examiner can normally be reached on Monday-Friday from 8:00 AM to 3:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jerry Lorengo, can be reached at (571) 272-1233.

The fax number for all official communications is (571) 273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/cmk/
June 3, 2008

/C. Melissa Koslow/
Primary Examiner
Art Unit 1793